

TAXONOMIC NOTES ON *KEYSSERIA* AND *PYTINICARPA* (ASTERACEAE: ASTEREAEE, LAGENIFERINAE)

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ABSTRACT

Keysseria is divided between Indonesia (9 species in New Guinea, Celebes, and Borneo) and the Hawaiian islands (3 species). The Hawaiian species are formally segregated here as *Keysseria* sect. *Sandwicactis* Nesom, sect. nov., on the basis of their bisexual and fertile disc florets (vs. functionally staminate in Indonesia) and other morphological differences in ray and disc corollas. *Keysseria pickeringii* A. Gray, endemic to Vanua Levu Island, Fiji, is excluded from *Keysseria* and formally recognized as *Pytinicarpa pickeringii* (A. Gray) Nesom, comb. nov. A nomenclatural update and summary are provided for *Pytinicarpa*, whose other two species are New Caledonian. The genera of Lageniferinae, including *Keysseria* and *Pytinicarpa*, are divided into seven "core genera" and five "peripheral genera"; a key to the core genera is provided.

RESUMEN

Keysseria está dividido entre Indonesia (9 especies en Nueva Guinea, Celebes, y Borneo) y las islas Hawai (3 especies). las especies Hawaianas se segregan formalmente aquí como *Keysseria* sect. *Sandwicactis* Nesom, sect. nov., en base a sus flósculos bisexuales y fértiles (vs. funcionalmente estaminadas en Indonesia) y otras diferencias morfológicas en las corolas centrales y periféricas. *Keysseria pickeringii* A. Gray, endémica de la isla Vanua Levu, Fiji, se excluye de *Keysseria* y se reconoce formalmente como *Pytinicarpa pickeringii* (A. Gray) Nesom, comb. nov. Se ofrece una puesta al día y resumen nomenclatural para *Pytinicarpa*, cuyas otras dos especies son de Nueva Caledonia. Los de Lageniferinae, que incluyen *Keysseria* y *Pytinicarpa*, se dividen en siete "centrales" y cinco "géneros periféricos"; se ofrece una clave para los géneros centrales.

Keysseria Lauterbach (Lauterbach 1914) is a genus of 12 species divided between Indonesia (9 species plus infraspecific taxa; Koster 1966) and Hawaii (3 species; Mill 1990, 1999 – see below). All of the Indonesian species occur in New Guinea; *K. radicans* (F. Muell.) Mattf. also is known from Celebes and *K. gibbsiae* (Merrill) Cabrera ex Steenis also occurs on Mt. Kinabalu in Borneo. The genus was treated as a member of Astereae subtribe Lageniferinae by Nesom (1994a, 2000) and a recent morphological and taxonomic overview is available (Nesom 2000).

The three Hawaiian species were transferred to *Keysseria* from *Lagenifera* Cass. by Cabrera (1966). Mill (1990, 1999) maintained them in a broadly conceived *Lagenifera*, indicating that *Keysseria* was to be regarded as a synonym. Swenson and Bremer (1994) also explicitly regarded *Keysseria* as a synonym of *Lagenifera*. Perspective on morphological distinctions among these genera is provided below in the key to the "core genera" of Lageniferinae.

The Hawaiian plants of *Keysseria* are similar to the Indonesian ones in habitat, habit, and morphological details but differ as follows: disc florets with fertile ovaries (vs. functionally staminate), ray corollas usually deeply and asymmetrically 2-4-lobed at the apex (vs. apically entire), and disc corollas sometimes 5-lobed (vs. consistently 4-lobed). Mill (1990) noted that the Hawaiian species apparently are “from one founder;” in this summary of supraspecific taxonomy of *Keysseria*, they are treated as a separate section.

Keysseria Lauterbach, Repert. Spec. Nov. Regni Veg. 13:241. 1914. *Myriactis* Less. subg. *Hecatactis* F. Muell., Trans. Royal Soc. Victoria 1, 2:13. 1889. *Hecatactis* (F. Muell.) F. Muell. ex Mattf., Bot. Jahrb. Syst. 62:407. 1929. *Keysseria* sect. *Hecatactis* (F. Muell.) Mattf., Bot. Jahrb. 68:250. 1937. TYPE: *Keysseria papuana* Lauterbach (= *Keysseria radicans* (F. Muell.) Mattf.).

The nine Indonesian species constitute sect. *Keysseria*.

Keysseria Lauterbach sect. **Sandwicactis** Nesom, sect. nov. TYPE: *Keysseria erici* (C.N. Forbes) Cabrera.

Differt a *Keysseria* sect. *Keysseria* floribus discii ovariiis fertilibus, corollis radii plerumque ad apicem 2-4-lobatis, et corollis discii aliquando 5-lobatis.

Species included: *K. erici*, *K. maviensis* (H. Mann) Cabrera, and *K. helenae* (C.N. Forbes & Lydgate) Cabrera.

The “core genera” of Lageniferinae

Lagenifera Cass. and genera similar to it have been grouped together as the subtribe Lageniferinae (Table 1) (Nesom 1994a). Three genera have been added to the Lageniferinae since the recent classification and overview: *Lagenocypsela* U. Swenson and K. Bremer (Swenson & Bremer 1994); *Pytinicarpa* Nesom (Nesom 1994b); and *Pappochroma* Raf. (Forbes & Morris 1996; Nesom 1994c, 1994d, 1998; synonyms = *Lagenopappus* Nesom and *Lagenithrix* Nesom). The 12 genera and approximately 71 species of Lageniferinae are distributed from India to southeast Asia, Australia, and various Pacific islands, except for the nine species of *Lagenifera* and *Myriactis* native to South America and Central America. Plants of the seven “core genera” of Lageniferinae (Table 1) are primarily characterized (with exceptions) by a herbaceous habit, leaves mostly in a basal rosette, heads borne singly on scapose or scapiform stems or few in a loose panicle, pistillate florets with reduced lamina and in several series, a tendency to produce functionally staminate disc florets, and flat, 2-nerved, epappose cypselae, commonly with a glandular apex or beak. The remaining five “peripheral genera,” while similar in geography, may not be closely related to the others; they differ in combinations of various features, particularly in subterete, multinerved cypselae.

A key to the “core genera” provides perspective for the positioning of *Keysseria* and its distinction within the group.

TABLE 1. Composition of subtribe Lageniferinae.

“core genera”

- Keyseria* Lauterbach (12 species; Hawaiian Islands and Indonesia–New Guinea, Celebes, and Borneo)
Lagenifera Cass. (15 species; Australasia and South America)
Lagenocypsela U. Swenson & K. Bremer (2 species; New Guinea)
Myriactis Less. (ca. 19 species; Central America, South America, southeast Asia, Indonesia)
Pappochroma Raf. (9 species; Australia and Tasmania).
 Synonyms = *Lagenopappus* Nesom and *Lagenithrix* Nesom
Piora Koster (1 species; New Guinea)
Solenogyne Cass. (3 species; Australia, New Zealand)

“peripheral genera”

- Pytinicarpa* Nesom (3 species; New Caledonia and Fiji)
Rhamphogyne S. Moore (1 species; Rodrigues Island)
Rhynchospermum Reinw. (1 species; Japan, Korea, Ryukyus, Formosa, Malaysia, and India)
Sheareria S. Moore (2 species; southern and southeastern China)
Thespis DC. (3 species; southeast Asia)

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1. Pappus of barbellate bristles. _____ **Pappochroma**
 1. Pappus none.
 2. Disc corollas infundibular, the tube abruptly opening into a broad limb, 4-lobed or 5-lobed; flowering stems leafy or scapiform; plants perennial and arising from a thick rhizome or a procumbent stem (*Keyseria*, *Piora*, and *Myriactis* p. p.) or annual from a thin base (*Myriactis* s. str.).
 2. Disc corollas tubular-funnelform, gradually opening into the limb, 5-lobed; flowering stems scapiform; plants short-lived, perennial, arising from a barely evident caudex region.
 3. Phyllaries narrowly lanceolate to linear, acute to acuminate; capitula radiate—lamina of ray florets strongly developed; cypselar beak well-developed, glandular. _____ **Lagenifera**
 3. Phyllaries elliptic-obovate to oblong, bluntly rounded to obtuse; capitula disciform—lamina of ray florets rudimentary or absent; cypselar beak pronounced to rudimentary or absent, the fruits mostly eglandular.
 4. Cypselar beak conspicuous; ovaries of disc florets completely absent; leaves entire. _____ **Lagenocypsela**
 4. Cypselar beak rudimentary or absent; ovaries of disc florets present, sterile; leaves toothed. _____ **Solenogyne**
 5. Annual or perennial herbs, not aromatic; leaves thin-herbaceous, flat-margined, sometimes subclasping but not basally dilated or sheathing, the basal often persistent but the cauline continuing unreduced in size halfway to nearly completely up the stem. _____ **Myriactis**
 5. Perennial herbs to subshrubs or shrubs, at least some species aromatic; leaves thickened to coriaceous, usually with revolute or deflexed margins, basally dilated and sheathing, evenly arranged along the stems or in rosulate clusters.
 6. Leaves of current year in a rosulate or subrosulate cluster, the heads

on long, scapiform peduncles; anthers with a short apical appendage.

_____ **Keysseria**

6. Leaves densely and more or less evenly arranged on the stems, the heads without an evident peduncle; anthers without an apical appendage. _____ **Piora**

Transfer of *Keysseria pickeringii* to *Pytinicarpa*

Keysseria pickeringii, originally described by Gray (1861), is endemic to Vanua Levu Island, Fiji. Smith and Carr (1991, p. 302) noted “it is not possible to suggest a New Guinean relative of *Keysseria pickeringii*, which is remarkable for its very small heads and its costate achenes.” This species, which has a basal rosette of narrow leaves loosely villous-strigose on both surfaces, monocephalous and minutely bracteate, scapiform stems, small, radiate heads, convex receptacles, functionally staminate disc florets, and subcylindric, eglandular cypselae 4 mm long with 8–10 longitudinal, strongly raised nerves and a truncate, epappose apex, is a member of the recently described genus *Pytinicarpa* Nesom (Nesom 1994b), which originally included two species from New Caledonia. Some features of *Pytinicarpa* (geography, solitary capitula on scapose stems, functionally staminate disc florets, epappose cypselae) suggest that it shares close ancestry with genera of Lageniferinae, but the conical-convex receptacles, ray florets in a single series, and multinerved, subcylindric cypselae are unusual in that subtribe.

Pytinicarpa pickeringii (A. Gray) Nesom, comb. nov. *Lagenophora pickeringii* A. Gray, Proc. Amer. Acad. Arts 5:121. 1861. *Keysseria pickeringii* (A. Gray) Cabrera, Blumea 14:307. 1966. TYPE: FIJI: Vanua Levu Island, Mathuata Mts., [ca. Jul 1840], Wilkes Expl. Exped. s.n. (HOLOTYPE: US!).

Pytinicarpa pickeringii differs from both New Caledonian species in its cypselar surface, which is minutely papillate, the center of each cell abruptly raised into a sharp point. In the New Caledonian species, these epidermal cells are similarly quadrate but the whole surface of each cell is convex and the cypselar surface has a “frothy” appearance. The relatively broad leaves of *P. pickeringii* are more like those of *P. sarasinii* (see below) rather than the linear leaves of *P. neocaledonia*, but those of *P. pickeringii* are obovate-spatulate, abruptly narrowed to a petiolar base, and the margins are shallowly crenulate-mucronulate (vs. oblanceolate, without a distinct petiolar portion, with margins coarsely toothed only near the apex).

There is some indication that the narrow “coronal rim” of the cypselae in *Pytinicarpa pickeringii* might have been sticky when fresh, which is a general feature of the Lageniferinae. This rim is similar to that illustrated for the cypselae of *P. sarasinii* (Nesom 1994b), where stickiness was not evident.

Nomenclature of New Caledonian *Pytinicarpa*

Lagenifera neocaledonica S. Moore predates *Brachyscome sarasinii* Daniker,

which was the basionym for one of the two original species in *Pytinicarpa* (Nesom 1994b). Cabrera (1966), in his list of species excluded from *Lagenifera*, recognized that these two names refer to the same species. But because the epithet “neocaledonica” already exists in *Pytinicarpa* for the second species, *P. sarasinii* is the correct designation of the broad-leaved New Caledonian species named by Moore and Daniker. The two New Caledonian species are as follows.

1. *Pytinicarpa sarasinii* (Daniker) Nesom, *Phytologia* 76:138. 1994. *Brachyscome sarasinii* Daniker, *Mitt. Bot. Mus. Univ. Zürich* 142:479. 1933. TYPE: NEW CALEDONIA: Am obern Abhang des Mut. Koniambo bei der Mine Boume I, zerstreut im lichten Gebusch an felsigen stellen, 14 Jan 1925, *Daniker* 880 (HOLOTYPE: Z).

Lagenifera neocaledonica S. Moore, *J. Linn. Soc. Bot.* 45:345. 1921 (non *Pytinicarpa* (*Brachyscome*) *neocaledonica* (Guill.) Nesom 1994). TYPE: NEW CALEDONIA: Taom, bare red serpentine earth, 2500 ft, rare, 2 Dec 1914, *R.H. Compton* 2305 (HOLOTYPE: BM, photocopy!).

2. *Pytinicarpa neocaledonica* (Guill.) Nesom, *Phytologia* 76:138. 1994. *Brachyscome neocaledonica* Guill., *Bull. Soc. Bot. France* 84:61. 1937. SYNTYPES: NEW CALEDONIA: Gatope, *Viellard* 2823 (AA! GH!); Néhoué, *Pancher* 425 and *Deplanche* 425.

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